

# NIH...Turning Discovery Into Health

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## Progress in Heart, Lung, and Blood Research

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### Arrhythmias

The human heart is an amazing biological machine controlled by electricity. Charged molecules, including sodium, calcium, and potassium, flow in and out of heart cells in a precisely coordinated rhythm each time the heart beats: about 100,000 times a day. If this normally reliable rhythm falters — called an arrhythmia — abnormal electrical activity causes the heart to beat too fast, too slow, or erratically. Although most arrhythmias are harmless, some can starve organs of vital oxygen carried by blood.

Atrial fibrillation, the most common type of serious arrhythmia, affects more than 2 million people in the United States each year. “A-fib” causes troubling symptoms and increases the risk of stroke and heart failure. National Heart, Lung, and Blood Institute-funded research is pointing the way toward much-needed new medicines and interventions that help control A-fib.

Other types of arrhythmias, such as ventricular fibrillation, or “V-fib,” are less common but much more deadly. The heart stops beating without warning, cutting off blood flow to the brain and other vital organs. Such rhythm abnormalities can lead to sudden death if not corrected right away.

Research on arrhythmias has prevented many unnecessary deaths. Nearly two decades ago, a landmark study funded by the NHLBI tested whether a particular class of anti-arrhythmia drugs could prevent sudden cardiac arrest in people who had just had a heart attack.

The study showed that these drugs actually increased the likelihood of life-threatening arrhythmias, prompting the Food and Drug Administration to limit the drugs’ use.

Landmark NHLBI-funded research also led to the widespread use of automated external defibrillators, or AEDs. When placed on the chest, these life-saving devices send an electric shock to the heart to restore its normal rhythm. With AEDs now prevalent in public places including airports and office buildings, bystanders with minimal training can save lives.

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#### *Imagine the Future ...*

*Stem cell therapies deliver natural “pacemakers” that restore rhythm to damaged or defective heart tissue.*

*Real-time, MRI-guided surgery removes tiny sections of heart tissue that beat abnormally.*

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*The NIH’s National Heart, Lung, and Blood Institute provides global leadership for research, training, and education programs to promote the prevention and treatment of heart, lung, and blood diseases and enhance the health of all individuals so that they can live longer and more fulfilling lives.*

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